d. Assuming that the height increases at the constant rate of 3 in. per year, does the weight also increase at a constant rate? Explain how you arrived at your answer.

e. What is a reasonable domain for t for the composite function $W \circ h$?

f. *Composite Functions Numerically Problem:* Functions f and g are defined only for the values of x in the table.

x	$f(x)$	$g(x)$
3	2	4
4	6	5
5	3	8
6	5	3

Find these values, or explain why they are undefined: $f(g(3))$, $f(g(4))$, $f(g(5))$, $f(g(6))$, $g(f(6))$, $f(f(3))$, and $g(g(3))$.

Two Linear Functions Problem: For parts g–j, let functions f and g be defined by

$$f(x) = x - 2 \qquad 4 \le x \le 8$$

$$g(x) = 2x - 3 \qquad 2 \le x \le 6$$

g. Plot the graphs of f, g, and $f(g(x))$ on the same screen. Sketch the results.

h. Find $f(g(4))$.

i. Show that $f(g(3))$ is undefined, even though $g(3)$ is defined.

j. Calculate the domain of the composite function $f \circ g$ and show that it agrees with the graph you plotted in part g.

R5. Figure 1-8i shows the graph of $f(x) = x^2 + 1$ in the domain $-1 \le x \le 2$.

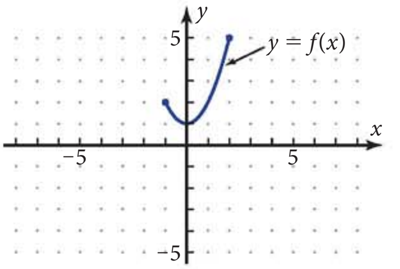

Figure 1-8i

a. On a copy of the figure, sketch the graph of the inverse relation. Explain why the inverse is not a function.

b. Plot the graphs of f and its inverse relation on the same screen using parametric equations. Also plot the line $y = x$. How are the graphs of f and its inverse relation related to the line $y = x$? How are the domain and range of the inverse relation related to the domain and range of function f?

c. Write an equation for the inverse of the function $y = x^2 + 1$ by interchanging the variables. Solve the new equation for y in terms of x. How does this solution reveal that there are two different y-values for some x-values?

d. On a copy of Figure 1-8j, sketch the graph of the inverse relation. What property does the function graph have that allows you to conclude that the function is invertible? What are the vertical lines at $x = -3$ and at $x = 3$ called?

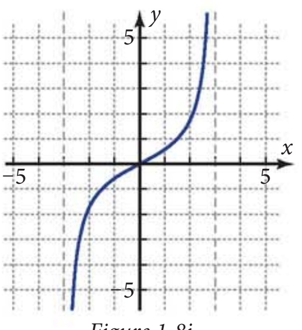

Figure 1-8j